

REMARKS

Claims 1, 2, 4, 6, 7, 10-16, 18, 20-24 and 43-47 are pending. No new matter has been added by way of the present amendments. For instance, claims 1 and 15 have been amended to clarify the language relating to "Val13" and to define the DNA fragment as being 2.6 to 13.8 kb in length as supported by the present specification at page 7, lines 11-28, page 15, lines 13-29 as well as the present Figures. The amendment to claim 6 is supported by the present specification, for example, at page 3, lines 18-21. Similar to claims 1 and 15, the language relating to Val13 has also been clarified in claim 7. The dependencies of claims 10-12 and 21 have been amended. The phrase "non-resistant" has been clarified in claims 13 and 14. Claim 22 has been amended to clarify the fact that the DNA fragment "is" isolated from genomic DNA and to adopt a suggested amendment made by the Examiner in item 5 of the outstanding Office Action. New claims 43, 44 and 47 are supported by the present specification at page 7, lines 11-28, page 15, lines 13-29 as well as the present Figures. Lastly, new claims 45 and 46 are supported by originally filed claim 1 as well as the present specification at page 20, line 37 to page 21, line 4. Accordingly, no new matter has been added.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Objections to the Claims

The Examiner has objected to claims 13 and 22 for the reasons recited at page 2 of the outstanding Office Action. Applicants traverse these objections.

First, the Examiner objects to claim 13 for reciting "non-resistant" plants and suggests replacing this language with "plants lacking resistance to protoporphyrinogen-inhibiting herbicides". Applicants have adopted this language in claim 13 as well as claim 14. Reconsideration and withdrawal of this objection are requested.

Second, the Examiner has objected to claim 22, asserting that the word "is" should be inserted in line 6 before "replaced." Applicants have adopted this suggestion. Accordingly, this objection is moot. Reconsideration and withdrawal thereof are requested.

Issues under 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 1, 2, 4, 6, 7, 10-16, 18, and 20-24 under 35 U.S.C. § 112, second paragraph for the

reasons recited at pages 3-4 of the outstanding Office Action. Applicants respectfully traverse each of these rejections.

First, the Examiner has rejected claims 1 and 15 for reciting the term "an" in connection with the recitation of "nucleotide sequence encoding an amino acid sequence of SEQ ID NO:1". Applicants have adopted the Examiner's suggested amendment of replacing these recitations of "an" with "the". Accordingly, this rejection is moot.

Second, the Examiner has rejected the recitation of "an amino acid corresponding to Val13 in SEQ ID NO:1" in part (3) of claims 1 and 15. Applicants traverse and submit that this language has been clarified and now recites "the amino acid corresponding to valine at position 13 of SEQ ID NO:1". Accordingly, this rejection is moot.

Third, the Examiner has rejected claims 1, 7, 15, and 22 for the recitation of "corresponding". With regard to the phrase "corresponding to" in claims 1, 7, 15 and 22, Applicants do not agree with the Examiner's assertions. Concerning claims 1, 7 and 15, the "corresponding" amino acid is the valine at position 13 of SEQ. ID. NO.:1. Similarly, for claim 22, the "corresponding" nucleotide is the guanine at position 37 of SEQ. ID. NO.:4. One of ordinary skill in the art would have no problem ascertaining the metes and bounds of this claims language. Accordingly, this rejection is moot.

Fourth, the Examiner has rejected claim 6 for reciting "wherein said protein has protoporphyrinogen oxidase activity in *Chlamydomonas*" asserting that it is not clear if the recitation indicates that the protein is a *Chlamydomonas* protein. Applicants have amended claim 6 to recite that "the plant is the green algae *Chlamydomonas*". Accordingly, this rejection is moot.

Fifth, the Examiner has rejected claim 22 asserting that the recitation of "the DNA fragment encodes a protein" broadens the scope of claim 20, upon which it depends. Applicants traverse and submit that this language has been removed from claim 22. Accordingly, this rejection is moot.

Sixth and lastly, the Examiner has rejected language in claim 22 and has suggested replacing the phrase "has a sequence that can be" with "is". Applicants have adopted this suggested amendment. Accordingly, this rejection is moot.

In view of the above comments, Applicants submit that the presently pending claims fully satisfy the requirements of 35 U.S.C. § 112, second paragraph. Accordingly, the Examiner is requested to withdraw these rejections.

Issues under 35 U.S.C. § 112, first paragraph

Written Description

The Examiner has rejected claims 1, 2, 4, 6, 7, 10-16, and 20-24 under 35 U.S.C. § 112, first paragraph for the reasons recited at pages 4-9 of the outstanding Office Action. Applicants respectfully traverse this rejection.

First, The Examiner points out that although the Xho/PmaC2.6 fragment conferred resistance to a herbicide sensitive *Chlamydomonas* strain, it does not contain the entire gene. At the Interviews conducted on October 31, 2002 and November 12, 2002, the Examiner appeared to indicate that a biological deposit of XhoPmaC2.6 DNA fragment would overcome this rejection. Applicants will consider this option only if the Examiner states on the record that such a deposit would be sufficient to overcome this rejection. However, in view of the present claims, Applicants submit that this is unnecessary.

Second, the Examiner also takes issue with the claim limitation which states "a part of a protein." However, Applicants submit that this language has been removed from the present claims. Thus, this aspect of the Examiner's rejection is moot.

Third, the Examiner also refers to the disclosure of Randolph-Anderson et al., "Isolation and characterization of a mutant protoporphyrinogen oxidase gene from *Chlamydomonas*

*reinhardtii* conferring resistance to porphyric herbicides," *Plant Molecular Biology*, 38: 839-859 (1998)). The Randolph-Anderson article describes that that Eco13.8 and Hind10.0 clones have the same or higher levels of transformation as Cos2955, indicating that the entire resistance gene and its regulatory sequences must be located in the smaller fragment of Hind10.0 (see page 846, left column under "Subcloning of the Cos2955 insert" section). A mutation of G→A at bp 5751 in Hind 10.0 appears to confer the desired herbicidal resistance (see page 851, right column, lines 9-17 of Randolph-Anderson). Also, the amino acid change at Val389 in the protein appears to confer the same resistance (see the Examiner's comments in the August 14, 2001 Office Action, page 10, lines 11-17).

Accordingly, the Hind10.0 fragment appears to confer PPO resistance, but the Examiner states that a DNA fragment encoding only a part of the oxidase protein may or may not confer the PPO resistance. Applicants submit that independent claims 1 and 15 require that the DNA fragment be 2.6 to 13.8 kb in length. Thus, this concern of the Examiner has been addressed.

Fourth, the Examiner asserts that the hybridization conditions recited in the present claims are incomplete, since they allegedly require the temperature of the wash conditions. The Examiner asserts that "[i]t is well known in the art that

wash temperatures that do not correspond to high stringency conditions allow the hybridization of sequences that are unrelated to a template sequence." However, Applicants submit that the Examiner's assertion is incorrect.

Washing is important when the original hybridization conditions are low stringency. Under these circumstances of lowly stringent original hybridization conditions, washing becomes particularly important to remove unrelated, hybridized sequences. However, when stringent conditions, such as those claimed, are used, the need for the removal of unrelated, hybridized sequences does not arise. Thus, regardless of the temperature of the wash conditions, it is not possible to remove what is not already bound. In other words, even if low stringency washing is performed after stringent hybridization, additional molecules will not bind.

If the Examiner continues to maintain that the temperature of the wash conditions (following stringent hybridization) allow hybridizing of unrelated sequences, Applicants hereby challenge this assertion. This challenge is based upon the reasoning above. Thus, to maintain that "[i]t is well known in the art that wash temperatures that do not correspond to high stringency conditions allow the hybridization of sequences that are unrelated to a template sequence", Applicants request that the Examiner produce evidence to support this assertion.

Alternatively, if the Examiner is relying upon personal knowledge to support the finding of what is known in the art, the Examiner is respectfully requested to provide an affidavit or declaration setting forth specific factual statements and explanations to support such an assertion. In this regard the Examiner is referred to 37 C.F.R. §1.104(d)(2).

In view of the above arguments, Applicants submit that the present claims describe subject matter which is fully described by the present specification. The present claims describe sufficient structure as well as corresponding function, such that one of skill in the art would be able to determine that, at the time of filing, Applicants were in possession of the invention as claimed. The Examiner is therefore requested to withdraw this written description rejection.

#### Enablement

The Examiner has rejected claims 1, 2, 4, 6, 7, 10-16, and 20-24 under 35 U.S.C. § 112, first paragraph for the reasons recited at pages 9-13 of the outstanding Office Action. Applicants respectfully traverse this rejection.

First, the Examiner asserts that the claims encompass "a part of a protein", but it is not clear how this "part of a protein" will confer PPO activity. Applicants submit that the language relating to "a part of a protein" has been removed



from the claims. Moreover, the size of the DNA fragments is recited in independent claims 1 and 15.

Second, the Examiner asserts that the present specification does not enable the homologous recombination of the DNA fragment with endogenous sequences in different plants. Applicants submit that homologous recombination is known in the art. For instance attached is a scientific articles (The EMBO Journal, Vol. 7, No. 13, pp. 4021-4026 (1988)), which reports integration of foreign DNA through homologous recombination in a tobacco plant. Accordingly, without undue experimentation, one of ordinary skill in the art would have no problem practicing the full scope of the currently claimed invention.

In view of the above arguments and the present claims, Applicants submit that the present application teaches how to make and use the presently claimed subject matter without undue experimentation. Accordingly, the Examiner is respectfully requested to withdraw the present enablement rejection.

Issues under 35 U.S.C. § 102(e)

The Examiner has rejected claims 15, 16, 18, 21 and 24 under 35 U.S.C. § 102(e) as being anticipated by Volrath et

al., USP 5,939,602 (hereinafter referred to as Volrath '602).  
Applicants respectfully traverse this rejection.

As a preliminary matter, Applicants note that the Examiner states that the changes made to 35 U.S.C. § 102(e) by the AIPA do not apply to the examination of the present application because it was not (a) filed on or after November 29, 2000, or (b) voluntarily published. Applicants submit that 35 U.S.C. § 102(e) was again amended by "The Intellectual Property and High Technology Technical Amendments Act of 2002" (Technical Amendments Act). The Technical Amendments Act contains revisions to 35 U.S.C. § 102(e) (and §374). As amended by the Technical Amendments Act, 35 USC § 102(e) must be applied to **all patent applications no matter when filed**. In other words, the revised statute applies to patent applications filed prior to the effective date of November 29, 2000 as well as to patent applications filed on or after November 29, 2000.

Regardless, the present claims are patentable over Volrath '602. Applicants submit that Volrath '602 is not valid prior art to the presently pending claims. Volrath '602 was filed on February 28, 1997 as a continuation-in-part of Application No. 08/472,028, filed on June 6, 1995, claiming priority to U.S. Provisional Applications 60/012,705, 60/013,612 and 60/020,003, filed on February 28, 1996,

February 28, 1996 and June 21, 1996, respectively. The earliest effective U.S. filing date of the present application is that of PCT/US96/20415 on December 27, 1996.

The present claims require that the amino acid corresponding to the valine at position 13 of SEQ ID NO: 1 be replaced with another amino acid. However, none of the U.S. Provisional applications (60/012,705, 60/013,612 and 60/020,003, copies attached) that Volrath '602 claims priority to, disclose that in a protein having protoporphyrinogen oxidase activity in plants, an amino acid corresponding to Val13 can be replaced with another amino acid. This feature was only first described in the February 28, 1997 continuation-in-part application (08/808,931) of Volrath '602. However, since the present claims are fully supported by PCT/US96/20415, having an effective U.S. filing date of December 27, 1996, Volrath '602 is not effective prior art. Accordingly, the present claims are novel over Volrath '602.

In view of the above remarks, Applicants respectfully submit that the present claims define subject matter that is patentable over the cited art. The present claims also fully satisfy the requirements of 35 USC § 112, first and second paragraphs. Accordingly, the Examiner is respectfully requested to withdraw all rejections and allow the currently pending claims.


Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of three (3) months to July 16, 2003 in which to file a reply to the Office Action. The required fee of \$930.00 is enclosed herewith.

If the Examiner has any questions or comments, please contact Craig A. McRobbie, Reg. No. 42, 874 at the offices of Birch, Stewart, Kolasch & Birch, LLP at the number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments: The EMBO Journal, vol. 7, no. 13, pp 4021-26 (1998)  
U.S. Provisional Applications 60/012,705,  
60/013,612 and 60/020,003